

## Two Zopheridae (Coleoptera: Tenebrionoidea) Species New to Korea and a Key to the Korean Genera

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### ABSTRACT

The Zopheridae Solier consisting of members from three previous families, Zopherinae Solier, Monommatinae Blanchard and Colydiinae Erichson, is considered the taxonomically most challenging group, and comprises more than 1,700 described species worldwide. The members of Zopheridae represent diverse morphological variations, and are difficult to separate morphologically from other tenebrionoid families. Two Zopheridae genera, *Colobicus* Latreille and *Lasconotus* Erichson, are identified for the first time in Korea, and two wood-boring species, *C. hirtus* (Rossi) and *L. niponicus* (Lewis), are newly reported in the Korean fauna. A key to the genera of Korean Zopheridae, and diagnoses, habitus photographs, and illustrations of diagnostic characters of the two species are provided.

**Keywords:** Coleoptera, Tenebrionoidea, Zopheridae, *Colobicus*, *Lasconotus*, Korea

### INTRODUCTION

The family Zopheridae Solier, 1834 consists of about 1,700 species and 190 genera in three subfamilies worldwide (Ślipiński and Lawrence, 2010) including 257 Palaearctic species placed in 45 genera (Ślipiński and Schuh, 2008). In the Korean Peninsula, six species in five genera have been recorded to date (Cho and Park, 2010). Many Zopheridae species are associated with dead and rotten wood (Ślipiński and Lawrence, 1999). Their source of nutrition is less certain, but the association with fungi is rather strong. Practically, adults of Usechini, Phellopini and some Zopherini are known to feed on polypore fruiting bodies (see Ivie, 2002 for detailed references).

Members of the Zopheridae are a very diverse group and difficult to diagnose. Most adults share the combination of following characters: antennae 9–11 articulated with terminal one, two or three antennomeres clubbed; antennal insertions concealed; mesocoxal cavities closed; tarsal formula 5-5-4 (in most Zopherinae) or 4-4-4 (in most Colydiinae) (apparently 3-3-3 in several colydiine genera); heteromeroid trochanters, and a tenebrionoid aedeagus (male genitalia) (Lord et al., 2011).

While studying Korean wood-boring beetles, two zopheridine species, *Colobicus hirtus* (Rossi) and *Lasconotus*

*niponicus* (Lewis), are discovered for the first time in the Korean Peninsula. We provide a key to Korean Zopheridae genera, habitus photographs, diagnose and illustrations of diagnostic characters of the species. All specimens are deposited in the Entomological Collection of Korea National Arboretum (KNAE), Pocheon, Korea.

### SYSTEMATIC ACCOUNTS

Order Coleoptera Linnaeus, 1758

Family Zopheridae Solier, 1834

#### Key to the genera of Korean Zopheridae

1. Antenna 11-articled with terminal three antennomeres clubbed ..... 2
- Antenna 10- or 11-articled with terminal one or two antennomeres clubbed ..... 4
2. Body elongate and parallel-sided; tarsal formula 4-4-4 ..... *Lasconotus*
- Body elongate-oval; tarsal formula 5-5-4 ..... 3
3. Body large, length more than 10.0 mm; procoxal cavities narrowly open ..... *Phellopsis*
- Body small, length less than 5.0 mm; procoxal cavities closed ..... *Usechus*

4. Body elongate and parallel-sided, relatively cylindrical, surface distinctly glossy ..... *Pycnomerus*  
– Body oval to elongate-oval; relatively flat, surface slightly glossy to matt ..... 5
5. Body oval; antennae 10-articled with terminal one antennomere clubbed ..... *Pseudotarphius*  
– Body elongate oval; antennae 11-articled with terminal two antennomeres clubbed ..... 6
6. Antennomere 3 distinctly elongate, more than twice as long as 4 ..... *Colobicus*  
– Antennomere 3 slightly elongate, less than twice as long as 4 ..... *Trachypholis*

<sup>1</sup>\*Genus *Colobicus* Latreille, 1807

*Colobicus* Latreille, 1807: 9. Type species: *Colobicus marginatus* Latreille, 1807.

**Diagnosis.** Body distinctly flattened, surface with recumbent setae; antennae 11-articled with terminal two antennomeres clubbed; antennomere 3 distinctly elongate, more than twice as long as 4; subantennal grooves long, reaching to posterior margin of eyes; pronotum transverse, widest in basal region; pronotal lateral margins explanate; procoxal cavities narrowly open; mesocoxae narrowly separated, separation less than metacoxal length; elytra with distinct striae composed short and recumbent setae; lateral margins of elytra explanate; tarsal formula 4-4-4 (Lord et al., 2011).

**Remarks.** This genus contains three species worldwide (Ślipiński and Schuh, 2008). The genus is similar to *Acolobicus* Sharp, *Bolococius* Dajoz and *Eucicones* Sharp, but can be distinguished by antennomere 3 very long, about as long as or longer than 4–6 combined (Ivie et al., 2016). This genus is recorded here for the first time in Korea.

<sup>2</sup>\**Colobicus hirtus* (Rossi, 1790) (Fig. 1)

*Nitidula hirta* Rossi, 1790: 59.

*Colobicus marginatus* Latreille, 1807: 10.

*Monotoma axillaris* Duftschmid, 1825: 55.

*Colobicus emarginatus* Erichson, 1845: 268.

*Colobicus hirtus*: Sasaji, 1984: 36; Kurosawa et al., 1985: 293; Ślipiński and Schuh, 2008: 81.

**Material examined.** 7 exx., Korea, Gyeonggi province: Pocheon-si, Soheul-eup, Korea national arboretum, 37°44' 46.3"N, 127°09'4.7"E, 30 Apr 2015, Nam JW, Kim MH, Kim MC leg., window trap in *Quercus* forest; 3 exx., same data as former except for '15 Apr 2015, lindgren funnel trap in *Kalopanax septemlobus*.'

**Diagnosis.** Length 3.8–5.4 mm; body oblong, 2.5–2.6 times

as long as wide. Body brownish black; anterior margin of head, antennae, lateral margins of pronotum, legs and outer margins of elytra reddish brown; surface glossy, with granular punctures and scale-like setae (Fig. 1A, B). **Head.** Subquadrate, about as long as wide; about 0.5 times as wide as pronotal width, widest across eyes; front of eyes slightly expanded and arcuate in lateral margins, truncate in anterior margin (Fig. 1C). Antennae (Fig. 1D) slightly shorter than head width; antennomeres 4–5 quadrate, 6–8 subquadrate, antennomere 9 transverse, 10 about 2.5 times as wide as long. **Thorax.** Pronotum subtrapezoidal, about as wide as elytral width; anterior angles produced; lateral margins gently round, with minute and indistinct serration; posterior margin subtruncate. Prosternal process elongate, brunt at apex; mesoventral process distinctly longer than metaventral process, truncate at apex. Elytra (Fig. 1E) parallel-sided, convergent in apical 1/3, with punctures and granular striae; elytron about 3.0–3.2 times as long as wide. **Genitalia.** Aedeagus as in Fig. 1F and G.

**Distribution.** Korea (new record), China, Japan, Russia, Europe, North Africa (Morocco).

**Remarks.** This species is recorded here for the first time in Korea. *Colobicus hirtus* (Rossi) is very similar to *C. parilis* Pascoe, but can be distinguished by lateral margins of pronotum relatively distinctly arcuate; elytra with long scale-like setae; humeral region with dense white setae; apex of median lobe of aedeagus distinctly shorter than apex of lateral lobes (Sasaji, 1984).

**Biology.** Some *Colobicus* species have been found in commercial shipments and stores of sweet potatoes and fruit crops, where it is suspected to spread fungal disease (Hinton, 1945; Ivie, 2002). This species was collected by lindgren funnel trap and window trap of deciduous trees.

<sup>3</sup>\*Genus *Lasconotus* Erichson, 1845

*Lasconotus* Erichson, 1845: 258. Type species: *Lasconotus complex* LeConte, 1859.

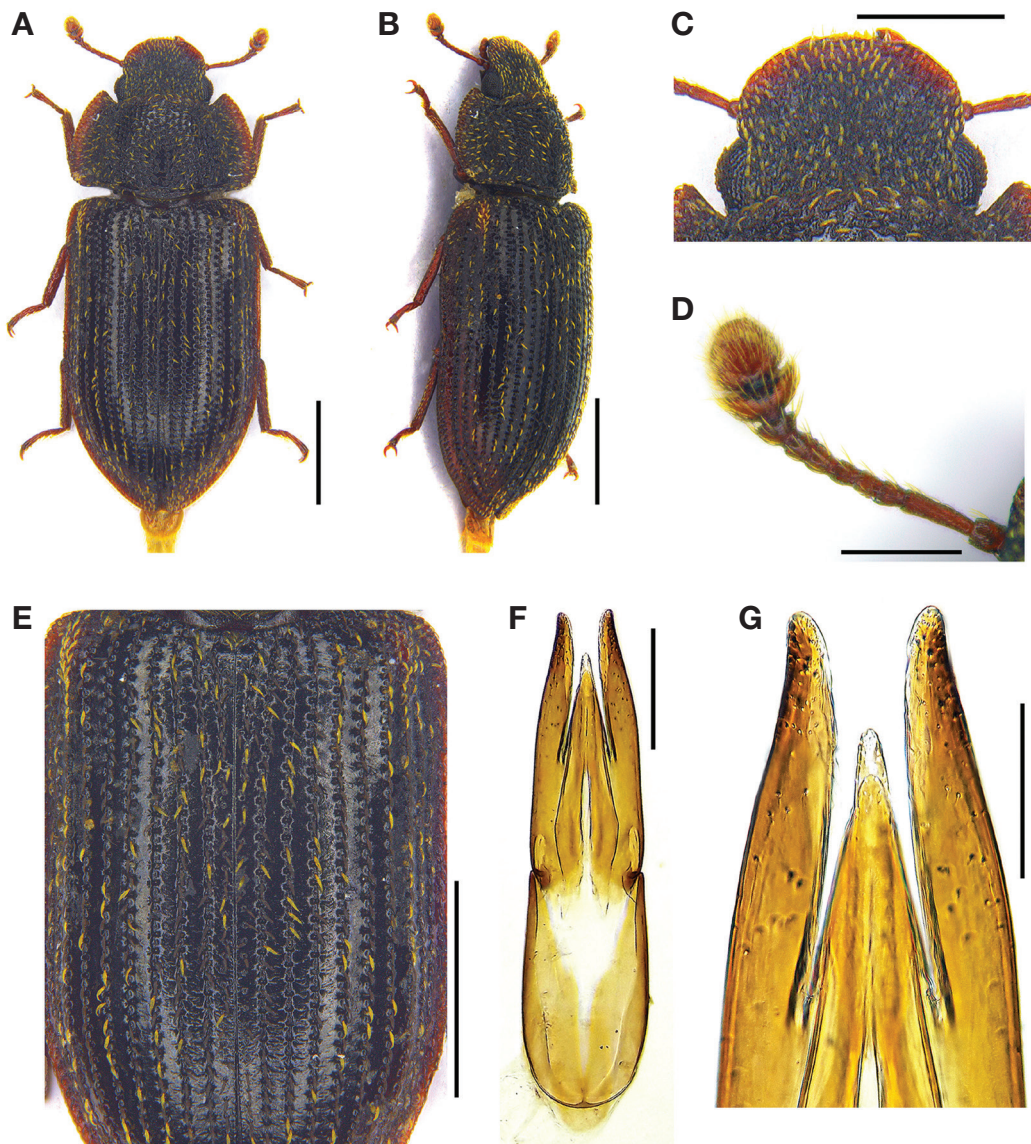
*Ithris* Pascoe, 1863: 134. Type species: *Ithris decisa* Pascoe, 1863.

*Lado* Wankowicz, 1867: 251. Type species: *Bitoma jelskii* Wankowicz, 1867.

*Othismopteryx* JR Sahlberg, 1871: 441. Type species: *Othismopteryx carinatus* J. R. Sahlberg, 1871.

*Anisopaulax* Reitter, 1877: 324. Type species: *Anisopaulax brucki* Reitter, 1877.

**Diagnosis.** Body elongate and parallel-sided, surface with recumbent setae; antennae 11-articled with terminal three antennomeres clubbed; antennomere 3 elongate, longer than



**Fig. 1.** *Colobicus hirtus*. A, Habitus (dorsal aspect); B, *ditto*; C, Head (dorsal aspect); D, Antenna; E, Elytral surface (dorsal aspect); F, Aedeagus (ventral aspect); G, Apex of aedeagus (ventral aspect). Scale bars: A, B, E=1.0 mm, C=0.5 mm, D, F=0.2 mm, G=0.1 mm.

4, not as long as 4 and 5 combined; subantennal grooves slightly developed or absent, reaching to posterior margin of eyes; pronotum elongate, widest in apical region in most; pronotal disc with one or two pairs of longitudinal carinae, often with depressions. procoxal cavities closed in most, narrowly open in a few; mesocoxae narrowly separated, separation less than metacoxal length; elytra with distinct carinae; tarsal formula 4-4-4 (Lord et al., 2011).

**Remarks.** This genus is included 37 species in the New

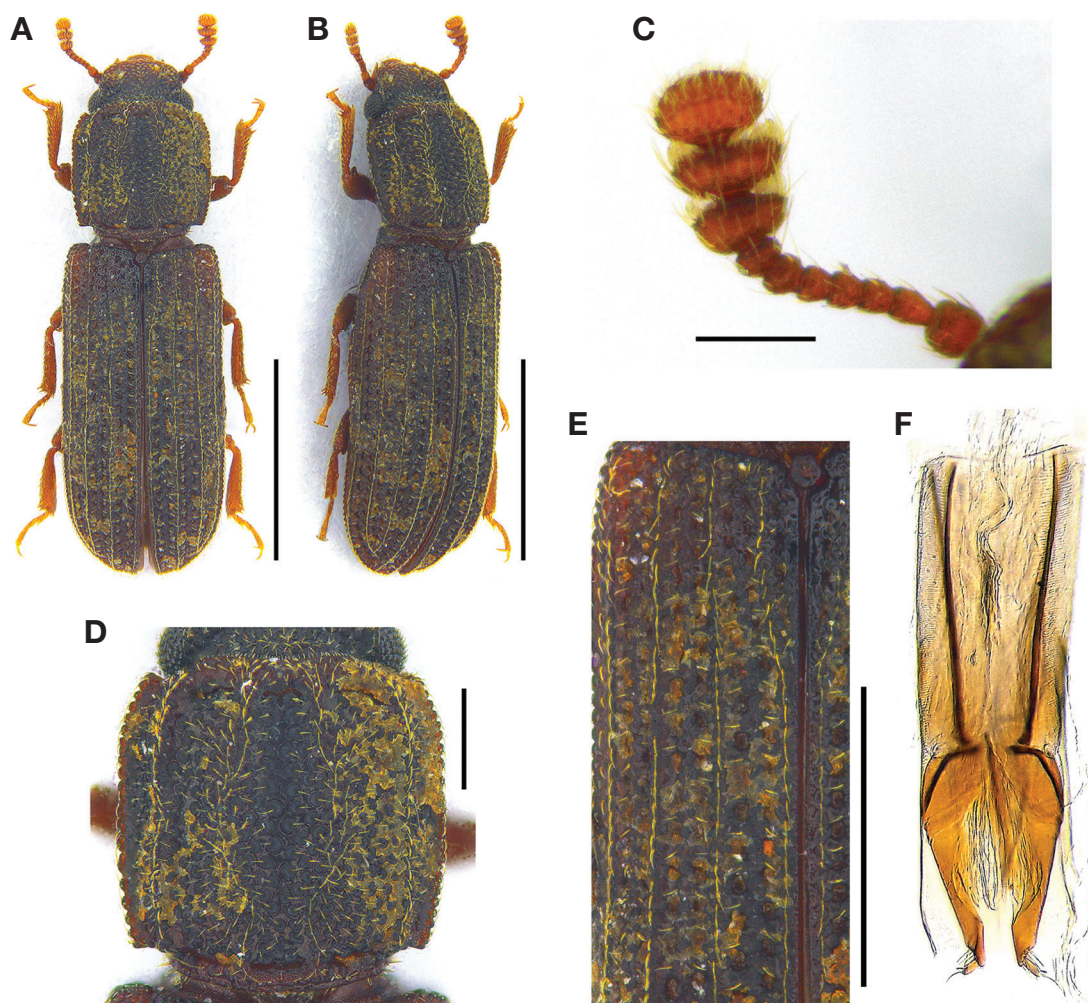
World is one of the largest groups within Zopheridae (Ivie et al., 2016). The genus *Lasconotus* is similar to *Bitoma* Herbst and *Microprius* Fairmaire, but can be distinguished by antenna 11-articled with distinctly terminal three antennomeres clubbed (Lord et al., 2011). This genus is recorded for the first time in Korea.

<sup>1</sup>\**Lasconotus okadai* Aoki, 2011 (Fig. 2)

*Bitoma niponia*: Kurosawa et al., 1985: 292; Aoki, 2009:

Korean name: <sup>1</sup>\*긴혹거저리 (신칭)





**Fig. 2.** *Lasconotus okadai*. A, Habitus (dorsal aspect); B, *ditto*; C, Antenna; D, Pronotum (dorsal aspect); E, Elytral surface (dorsal aspect); F, Ovipositors (dorsal aspect). Scale bars: A, B=1.0 mm, C=0.1 mm, D, F=0.2 mm, E=0.5 mm.

124 (misidentification).

*Lasconotus okadai* Aoki, 2011: 97; 2014: 276.

**Material examined.** 1 female, Korea, Gyeongbuk province: Uljin-gun, Geumgangsog-myeon, Sogwang-ri, 37°00' 31.69"N, 129°12'43.6"E, 17–31 May 2016, Nam JW, Kim MH, Kim MC, Park SY leg., window trap.

**Diagnosis.** Length about 2.5 mm; body 3.2–3.3 times as long as wide. Body dark brown; antennae and legs reddish brown; surface matt, with granular punctures and pubescence (Fig. 2A, B). **Head.** Subquadrate, about 0.75 times as wide as pronotal width, widest across eyes; front of eyes broadly round in antero-lateral margins, subtruncate in anterior margin; eyes relatively small and laterally prominent. Antennae (Fig. 2C) slightly shorter than head width; antennomeres 4–8 subquadrate to transverse, 9–11 distinct-

ly transverse, antennomere 9 large and slightly narrower than 10, 11 elliptical. **Thorax.** Pronotum (Fig. 2D) quadrate, about as long as wide, widest at almost apex, slightly narrower than elytral width; disc with depression in median region and one pairs of longitudinal carinae; anterior and posterior margins subtruncate; lateral margins almost parallel-sided, with minute and indistinct serration. Metaventricle without granulate parts. Elytra (Fig. 2E) parallel-sided, convergent in apical 1/6; elytron (Fig. 2E) about 4.2 times as long as wide, with granular punctures and five longitudinal carinae; fourth ridge connected with third ridge apically. Ovipositor as in Fig. 2F.

**Distribution.** Korea (new record), Japan.

**Remarks.** Previously known only from Japan, this species is recorded for the first time in Korea. *Lasconotus okadai* Aoki is very similar to *L. niponius* (Lewis), but can be dis-

tinguished by darker body-color; smaller eyes; antennomere 9 slightly narrower than 10; pronotal shape, with larger punctures and one pairs of carinae (Aoki, 2011, 2014; fig. 3A–D). I could not provide the illustration of genitalian structure because no specimens were available for dissection.

**Biology.** *Lasconotus* species have been known to be collected by beating vegetation, at MV/UV lights, and from under the bark of dead pines, including the root bark of *Pinus* species, and some *Lasconotus* species are natural enemies of ambrosia beetles (Lord et al., 2011). This species was collected by window trap in pine forest.

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